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10/509,103

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EXAMINER

YANG, JIE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JEAN BEGUINOT

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Appeal 2010-000494  
Application 10/509,103  
Technology Center 1700

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Decided: May 17, 2010

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Before EDWARD C. KIMLIN, ADRIENE LEPIANE HANLON, and  
CHARLES F. WARREN, *Administrative Patent Judges*.

KIMLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-15. A copy of illustrative claim 1 is appended to this Decision. We have jurisdiction under 35 U.S.C. § 6(b).

Claim 1 is illustrative:

1. Steel block for the manufacture of moulds for the injection moulding of plastics material or the moulding of metals or for the manufacture of metal-working parts, having a thickness greater than 20 mm, of which the structure is completely martensitic or martensite-bainitic, of which the hardness at all points is between 430 HB and 530 HB and of which the chemical composition of the steel comprises, in % by weight:

$$0.180\% \leq C \leq 0.400\%$$

$$\text{Si} < 0.15\%$$

$$\text{Mn} \leq 2.5\%$$

$$\text{Ni} \leq 3\%$$

$$\text{Cr} \leq 3.5\%$$

$$\text{Mo} + \text{W}/2 \leq 2.8\%$$

$$\text{V} + \text{Nb}/2 + \text{Ta}/4 \leq 0.5\%$$

$$\text{Al} \leq 0.4\%$$

$$\text{Ti} + \text{Zr}/2 \leq 0.1 \%$$

- boron in a content of between 0.0005% and 0.015%,
- optionally one or more elements from among sulphur, selenium and tellurium, the sum of contents of these elements being less than or equal to 0.2%,
- optionally one or more elements from among lead and bismuth, the sum of contents of these elements being less than or equal to 0.2%,
- optionally calcium in a content of less than or equal to 0.1%,

the remainder being iron and impurities resulting from production, the copper being an impurity, the chemical composition also satisfying the following equations:

$$3.2 \leq T \leq 19$$

$$85 \leq Dr \leq 95$$

$$U/Dr \leq 10.0$$

$$Mo^* + 3xV^* \leq 0.4\%$$

in which, for contents expressed in %:

$$Tr = 1.8xC + 1.1xMn + 0.7xNi + 0.6xCr + 1.6xMo^* + K$$

wherein  $K = 0$  if the steel does not contain boron and  $K = 0.5$  if the steel contains boron

$$Dr = 54xC^{0.25} + 24.5x(Mo^* + 3xV^*)^{0.30} + 1.58xMn + 0.74xNi + 1.8xSi + 12.5x(Cr)^{0.20}$$

$$U = 1600xC + 100x(0.25xCr + Mo^* + 4.5xV^*)$$

$$R = 3.8xC + 10xSi + 3.3xMn + 2.4xNi + 1.4x(Cr + Mo^*)$$

$$Mo^* = Mo + W/2$$

$$V^* = V + Nb/2 + Ta/4$$

the contents of boron, aluminium [sic, aluminum], titanium, zirconium and nitrogen, expressed in thousandths of % by weight, being such that:

$$B \geq \frac{1}{3} \times K1 + 0.5$$

wherein  $K1 = \text{Min}(I^*; J^*)$

$$I = \text{Min}(N; N - 0.29(Ti + Zr/2 - 5))$$

$$I^* = \text{Max}(0; I) \text{ and } J^* = \text{Max}(0; J)$$

$$J = \text{Min} \left( N; 0.5 \left( N - 0.52 A1 + \sqrt{(N - 0.52 A1)^2 + 283} \right) \right)$$

The Examiner relies upon the following references as evidence of obviousness (Ans. 3):

Bobbert	5,458,704	Oct. 17, 1995
Jiro	JP 8-165,542	Jun. 25, 1996
Beguinet	5,714,116	Feb. 03, 1998
Norström	6,048,491	Apr. 11, 2000

Appellant's claimed invention is directed to a steel block comprising the recited elements in amounts within the specified ranges. The steel block finds utility in making moulds.

Appealed claims 1-10 and 12-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Jiro in view of Beguinet and Bobbert. Claim 11 stands rejected under 35 U.S.C. §103(a) as being unpatentable over the stated combination of references further in view of Lars-Ake (Norström).

Appellant does not present separate arguments for any particular claim on appeal, nor does Appellant advance a separate substantive argument against the § 103 rejection of claim 11. Accordingly, all the appealed claims stand or fall together with claim 1.

We have thoroughly reviewed each of Appellant's arguments for patentability. However, we are in complete agreement with the Examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of § 103 in view of the applied prior art. Accordingly, we will sustain the Examiner's rejections for essentially those reasons expressed in the Answer, and we add the following for emphasis only.

There is no dispute that Jiro discloses, like Appellant, a steel block for making moulds comprising, with the exception of Si, the recited elements in ranges of amounts which either fall within or overlap the claimed ranges. The reference discloses 0.25-0.35 weight % of Si while appealed claim 1 recites less than 0.15 weight % Si. However, as pointed out by the Examiner, Beguinot discloses steel compositions for making high abrasion resistant articles, such as moulds, which comprise 1 weight % or less of Si for the purpose of making the steel easier to smelt without compromising its toughness (col. 3, ll. 12-14). Hence, we find no error in the Examiner's legal conclusion that it would have been obvious for one of ordinary skill in the art to use less than 1 weight % of Si in the steel composition of Jiro in order to attain the advantage taught by Beguinot. The Examiner's additional citation of Bobbert underscores the obviousness of formulating a steel composition comprising Si in the claimed amount.

Appellant submits that boron is necessary in the present invention whereas it is considered harmful in Jiro. However, as correctly pointed out by the Examiner, the reference expressly teaches that the steel composition may comprise boron in an amount of 0.002 % (*see abstract*).

Appellant also maintains that the claimed steel has a hardness between 430 HB and 530 HB, at all points, whereas the steel of Jiro has a hardness less than 460 HB by the side of the base material of a weld junction. However, hardness values less than 460 HB are within the claimed range. Also, Appellant has not refuted the Examiner's reasoning that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to control the preheating and post heating to obtain a desired hardness as demonstrated by JP'542 [Jiro]" (Ans. 11).

Appellant also submits that Beguinot “described an abrasion resistant steel, not a steel for moulds” (App. Br. 10, last para.). However, as set forth by the Examiner, the reference specifically teaches that the steel sheets are suitable for making moulds (col. 5, l. 51).

Appellant further maintains that the steel of Beguinot has to be such that the addition of Si + Al is  $\geq 0.6\%$ , and that the amount of Al must be  $\leq 0.2\%$ , which requires that the amount of Si  $> 0.4\%$ . Appellant errs, however, inasmuch as Beguinot teaches that Al is present in an amount of  $\leq 2$  weight %.

We are also not persuaded by Appellant’s argument that (Jiro) “teaches away from using an amount [of Si] lower than 0.25 wt%” (Reply Br. 4, fourth para.). While the English translation of the reference at paragraph [0014] teaches that “profitability is bad” if an amount of Si less than 0.25 weight % is used, we are satisfied that one of ordinary skill in the art would have found it obvious to sacrifice any such profitability to gain the advantage of easier smelting when using Si in an amount of less than 1 weight %, as taught by Beguinot. Moreover, as properly noted by the Examiner, it is well settled that where patentability is predicated upon a change in a condition of a prior art composition, such as a change in concentration or the like, the burden is on the Applicant to establish with objective evidence that the change is critical, i.e., it leads to a new, unexpected result. *In re Harris*, 409 F3d 1339, 1343 (Fed. Cir. 2005); *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955). In the present case, while Appellant mentions the effect of Si on thermal conductivity, Appellant has proffered no objective evidence which establishes that steel compositions comprising Si in the claimed

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amounts produce unexpected thermal conductivity, or any other unexpected property. Accordingly, the prima facie case of obviousness established by the Examiner stands unrebutted.

In conclusion, based on the foregoing and the reasons well stated by the Examiner, the Examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a) (2008).

AFFIRMED

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